App. No. 10/708,224
Amendment dated January 25, 2005
Reply to Office action of October 25, 2004

Amendments to the Specification (other than claims):

Please replace paragraph [0033] with the following amended paragraph:

[0033] The obtained sintered part is subjected to processing according to requirements. In cases where a conductive paste is to be screen-printed onto the sintered part in the ensuing manufacturing steps, the surface roughness is preferably [[5 □m]] 5 μm or less in Ra. If over [[5 □m]] 5 μm, in screen printing to form a circuit on the compact, defects such as blotting or pinholes in the pattern are liable to arise. More suitable is a surface roughness of [[1 □m]] 1 μm or less in Ra.

Please replace paragraph [0038] with the following amended paragraph:

[0038] The thickness of the conductive paste is preferably [[5 □m]] 5 μm or more and [[100 □m]] 100 μm or less in terms of its post-drying thickness. If the thickness is less than [[5 □m]] 5 μm the electrical resistance would be too high and the bonding strength would decline. Likewise, if in excess of [[100□m]] 100 μm the bonding strength would be compromised in that case as well.

Please replace paragraph [0043] with the following amended paragraph:

[0043] In that case, the amount of sintering promoter added preferably is 0.01 wt. % or more. With an amount less than 0.01 wt. % the insulative coating does not densify, making it difficult to secure electrical isolation of the metal layer. It is further

preferable that the amount of sintering promoter not exceed 20 wt. %. Surpassing 20 wt. % leads to excess sintering promoter invading the metal layer, which can end up altering the metal-layer electrical resistance. Although not particularly limited, the spreading thickness preferably is [[5 □m]] 5 μm or more. This is because securing electrical isolation proves to be problematic at less than [[5 □m]] 5 μm.

Please replace paragraph [0044] with the following amended paragraph:

[0044] Next, in the present method, the ceramic as substrates furthermore can be laminated according to requirements. Lamination may be done via a bonding agent. The bonding agent--being a compound of Group IIa or Group IIIa elements, and a binder and solvent, added to an aluminum oxide powder or aluminum nitride powder and made into a paste--is spread onto the bonding surface by a technique such as screen printing. The thickness of the applied bonding agent is not particularly restricted, but preferably is [[5 □m]] 5 μm or more. Bonding defects such as pinholes and bonding irregularities are liable to arise in the bonding layer with thicknesses of less than [[5 □m]] 5 μm.

Please replace paragraph [0054] with the following amended paragraph:

[0054] A further preferable condition is that the surface roughness of the wafer-carrying side be [[5 □m]] 5 μm in Ra. If the roughness is over [[5 □m]] 5 μm in Ra,

grains loosened from the AlN due to friction between the wafer holder and the wafer can grow numerous. Grain-loosened particles in that case become contaminants that have a negative effect on processes, such as film deposition and etching, on the wafer. Furthermore, then, a surface roughness of [[1 □m]] 1 μm or less in Ra is ideal.

Please replace paragraph [0058] with the following amended paragraph:

[0058] The planarity of the respective joining faces of the shaft and wafer holder to be joined preferably is 0.5 mm or less. Beyond this level interstices are liable to occur in the joining faces, impeding the production of a joint having adequate gastightness. A planarity of 0.1 mm or less is more suitable. Here, still more suitable is a planarity of the wafer holder joining faces of 0.02 mm or less. Likewise, the surface roughness of the respective joining faces preferably is [[5 □m]] 5 μm or less in Ra. Surface roughness exceeding this would then also mean that interstices are liable to occur in the joining faces. A surface roughness of [[1 □m]] 1 μm or less in Ra is still more suitable.

Please replace paragraph [0062] with the following amended paragraph:

[0062] Embodiment 1 - 99 parts by weight aluminum nitride powder and 1 part by weight Y_2O_3 powder were mixed and blended with 10 parts by weight polyvinyl butyral as a binder and 5 parts by weight dibutyl phthalate as a solvent, and doctor-bladed into green sheets 430 mm in diameter and 1.0 mm in thickness. Here, an

aluminum nitride powder having a mean particle diameter of [[0.6 □m]] 0.6 μm and a specific surface area of 3.4 m2/g was utilized. In addition, a tungsten paste was prepared with a tungsten powder of [[2.0 □m]] 2.0 μm mean particle diameter being 100 parts by weight, utilizing Y2O3 at 1 part by weight, 5 parts by weight ethyl cellulose, being a binder, and as a solvent, butyl Carbitol™. A pot mill and a triple-roller mill were used for mixing. This tungsten paste was formed into a heater circuit pattern on the green sheets by screen-printing.

Please replace paragraph [0063] with the following amended paragraph:

[0063] Pluralities of separate green sheets of 1.0 mm thickness were laminated onto the green sheets printed with the heater circuit to create laminates. Lamination was carried out by stacking the sheets in place in a mold, and thermopressing 2 minutes in a press at a pressure of 10 MPa while maintaining 50°C heat. The laminates were thereafter degreased within a nitrogen atmosphere at 600°C, and sintered within a nitrogen atmosphere under time and temperature conditions of 3 hours and 1800°C, whereby wafer holders were fabricated. Here, a polishing process was performed on the wafer-carrying side so that it would be [[1 □m]] 1 μm or less in Ra, and on the shaft-joining face so that it would be [[5 □m]] 5 μm or less in Ra. The wafer holders were also processed to true their outer diameter. The dimensions of the post-processing wafer holders were 340 mm outer diameter (L) and 20 mm thickness.